

IN THE CLAIMS:

Claims 1-20 and 29-41 were previously cancelled. Claim 21 has been amended herein. All of the pending claims are presented below. This listing of claims will replace all prior versions and listings of claims in the application. Please enter these claims as amended.

Listing of Claims:

1.-20. (Cancelled)

21. (Currently amended) A diode on a silicon substrate, comprising:
an active region in the silicon substrate, the active region being heavily doped
with a first type dopant;
a first refractory metal silicide layer contacting and covering at least a portion of
the active region;
an insulation layer contacting and covering at least a portion of the first refractory
metal silicide layer, the insulation layer having a diode opening extending therethrough
and communicating with the first refractory metal silicide layer;
a polysilicon plug disposed within the diode opening and contacting the first
refractory metal silicide layer, the polysilicon plug comprising:
a bottom portion in contact with the first refractory metal silicide layer
and being lightly doped with the first ~~conductivity~~-type dopant, and
a top portion in contact with the bottom portion; and
a material that is capable of changing states and resistivities vertically over and in
communication with the polysilicon plug.

22. (Previously presented) The diode as defined in claim 21, wherein the material that is capable of changing states and resistivities comprises a programmable resistor, the diode further comprising a metal contact vertically over and in communication with the programmable resistor.

23. (Previously presented) The diode as recited in claim 22, wherein the programmable resistor comprises at least one layer comprised of a memory material selected from the group consisting of ovonic and chalcogenide materials.

24. (Previously presented) The diode as defined in claim 22, wherein the programmable resistor further comprises at least one barrier layer.

25. (Previously presented) The diode as defined in claim 24, wherein the at least one barrier layer comprises titanium nitride.

26. (Previously presented) The diode as defined in claim 21, wherein the diode opening has a width in a range between about 0.3 microns to about 0.8 microns.

27. (Previously presented) The diode as defined in claim 21, further comprising a continuous second refractory metal silicide layer positioned between the polysilicon plug and the first refractory metal silicide layer and also between the polysilicon plug and the insulation layer.

28. (Previously presented) The diode as defined in claim 27, wherein the second refractory metal silicide layer is made of a refractory metal silicide selected from a group consisting of: titanium silicide, tungsten silicide, tantalum silicide, cobalt silicide, and molybdenum silicide.

29.-41. (Cancelled)